PROVIDER TRANSFER SERVER AND A METHOD OF PROVIDING A PROVIDER TRANSFER SERVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to provider transfer servicing technology, and it particularly relates to a provider transfer server and a service method that performs a connection service in an environment where there exist a plurality of network service providers; and, a user node that initiates connection to the network.

2. Description of the Prior Art

[0002] The Internet was initially used in academic settings primarily for searching for information. Recently, the Internet has become indispensable, as an infrastructure of electronic business transactions, for so-called B to B (a link between businesses), B to C (a link from business to consumers) and C to C (a link between consumers) communications. Information technology (IT) is a major driving force of economic development and so it is very important to maintain and expand the communication infrastructure which is a backbone of IT; and to offer a wide range of consumers a faster and more user-friendly network environment.

[0003] However, present conditions that surround consumers who utilize the Internet are not so user-friendly. Most consumers must bear the

communication expenses and connection charges to get on the Internet in order to access various services available on the Internet.

[0004] Fig. 1 illustrates, as the prior art, a system 10 in which a consumer (referred to as a user hereinafter) gets connected to the Internet by a dial-up connection. Through public network 16, a user node 18 dials an Internet service provider 14 (referred to as an ISP 14 hereinafter) to attempt to establish a connection. The ISP 14 is connected to the Internet 12 via an exclusive line so that the user node 18 is thereby connected to the Internet 12 by the ISP 14.

[0005] The communication expense starts when the user dials the ISP 14; while the connection charge is a handling fee of ISP 14. In order to keep communication charges as low as possible, consumers in general use dial-up connections instead of a permanent or online connection. To keep the connection charge low, it is necessary for consumers to find a service provider whose service charge is relatively low, among the many ISPs that now exist.

[0006] No further capability is required once an ISP connects a user to the Internet. Thus, for the user, it suffices that there is an ISP which offers an efficient connection environment, and no strong brand recognition for an ISP is necessary. Thus, users tend to contract with an ISP whose connection fee is lowest so that a user will attempt to establish connection through a single access point or a few available access points of the ISP. As a result thereof, the dial-up line frequently becomes busy so that the connection is difficult to

establish, in spite of the low connection fee. On the other hand, the ISP whose connection tends to be established rather easily, oftentimes charges a relatively high connection fee, thus creating a dilemma for the user wishing to use the Internet frequently.

SUMMARY OF THE INVENTION

[0007] The present invention has been made in view of the foregoing circumstance; and, an object is to provide technology by which the user node gets connected to the network in an efficient manner. Another object is to provide a connection technology through which the service providers maximize their profit.

[0008] The present invention relates to a provider transfer server (also referred to as a server hereinbelow). This server comprises a first communication unit which serves as an access point for the user node; a second communication unit which connects the server to any one of a plurality of connection service providers; a detection unit which detects the connection state of the plurality of the service providers; a selection unit which selects a provider based on the state detected by the detection unit and which instructs said second communication unit to connect to the selected service provider; and a communication channel which establishes the connection between the first and second communication units when the second communication unit connects to the access point of the selected service provider.

[0009] As an example of a provider, there is the ISP mentioned above and several other connection–related service providers. As an example of connection methods, there is the dial-up connection which realizes Point-to-Point Protocol (PPP), and several other connection methods or protocols.

[0010] In this system, a user node first accesses the first communication unit. This unit detects the connection service state of a plurality of providers checking, for example, the line congestion degree and the connection fee. Based on the detected information, a provider is selected whose line is open and connection fee is lowest, for example, and which is thus suitable for use. The second communication unit is then connected to the access point of the provider. At this point, a connection is established between the user node and the first communication unit, and another connection is established between the second communication unit and a provider. Thereafter, a communication channel is established between the first and second communication units, and finally the user node is connected to the provider in a manner such that the server plays a role as a relay station. Thus, as long as the user gets connected to the server, the server takes care of connecting the user to an appropriate provider so as to achieve high usability and increased convenience to the user.

[0011] The server may also include an authentication unit which verifies that the user is a legitimate user of the provider transfer server; also including a data supply unit which, upon request from the service provider, supplies data

necessary for the requested authentication. A user ID and a password are examples of the "data necessary for the requested authentication".

[0012] In this system, the user needs only to contract with an operator of the server, and it suffices that the server makes a contract with the provider on behalf of the user. Thus, the user has increased usability and convenience. Moreover, instead of each provider charging a connection fee to a plurality of users, the connection fee can be charged collectively to the contracting server. Each provider does not need to actually recognize the users connected to each provider, but only recognize that the server gets connected to the provider. The server is regarded as a user whose connection time to the provider is long.

[0013] The server may also include a recording unit which records sessions when the communication channel is established and a charge unit which calculates a service fee incurred by a user for each connection service provider, based on data from the session recorded by the recording unit. When the line of a provider is relatively vacant, the server connects the user to that provider so that the provider can obtain the additional revenue of a connection fee. It is desirable for the provider that the line usage rate will increase when the line is not busy, and part the connection fee thus earned will be reimbursed to the operator of the server as a handling fee. The structure may be such that the server bears the communication cost otherwise paid by the user node when connecting to a server, on the condition that the server receives the handling fees. This is a type of collect call scheme.

[0014] Since users are introduced by the server, the provider can eliminate overhead cost which is otherwise used in finding new clients. Thus, a site which has a low volume of usage can earn added revenue by opening its idle line capacity to the provider transfer server.

[0015] The server appears to be a sole user, on behalf of a plurality of users, to the provider, and each provider charges a connection fee to the operator of the provider. This connection fee equals the sum of the connection fees incurred when each user is connected to each provider. Thus, the charge unit will calculate for each user an allotted portion of the fee the operator paid to the providers, based on connection time data, and charge each user. Although each allotted fee is one which must be eventually paid by the user, the user benefits here because there is no need of making numerous contracts with several providers.

[0016] While the selected provider ultimately connects the user to the Internet, the second communication unit and a plurality of service providers may be connected in an area more local than the Internet. There is available a structure such that the server is interposed between the user nodes and an access point of the provider. The public network is generally used up to the access point, and the server is connected between the user node and the local provider. When the user and the server are connected in a local area which is not connected to the Internet, the system is secure. Moreover, when the server

is connected to the provider by a dial-up connection, the provider does not need to change its structure, thus it can better carry out its services.

[0017] The present invention also comprises the method of providing a provider transfer service. Detecting, at a selected time, the connection service state of a plurality of service providers; receiving a request in which a user requests to be connected to the network; selecting a service provider according to the state of activity detected; and relaying a communication between the service provider thus selected and the user node. In this method, an intermediary process is performed in a manner such that the provider transfer service is treated as a user, by the service provider thus selected while the user node is treated as a user by the provider transfer service. Thus, the advantage is that a user only makes a single contract with a server but the user can actually make use of a plurality of providers through the server.

[0018] Moreover, this summary of the invention does not necessarily describe all necessarily features so that the invention may also be sub-combination of these described features.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] Fig. 1 illustrates a conventional system in which a user is connected to the Internet by a dial-up connection.

[0020] Fig. 2 illustrates a system including a provider transfer server according to an embodiment of the present invention.

[0021] Fig. 3 is a block diagram showing the structure of the server.

[0022] Fig. 4 is a table showing the data structure of the provider information database.

[0023] Fig. 5 shows a screen display of a user terminal displaying the function of the preference registration unit.

[0024] Fig. 6 is a table showing data inside the user preference database.

[0025] Fig. 7 is a table showing data inside the session table.

[0026] Fig. 8 is a table showing the details of a debit note to a provider.

[0027] Fig. 9 is a table showing the details of a debit note for the connection fee charged to a user.

[0028] Fig. 10 shows the steps of the process performed between an ISP, the server and the user node.

[0029] Fig. 11 is a screen, showing the state of an ISP, displayed on the user terminal.

DETAILED DESCRIPTION OF THE INVENTION

[0030] The invention will now be described based on the preferred embodiments, which do not intend to limit the scope of the present invention, but exemplify the invention. All of the features and the combinations thereof described in the embodiment are not necessarily essential to the invention.

[0031] In Fig. 2, the same structural components as those shown in Fig. 1 are given the identical reference numerals, and different portions therefrom will be described here. A provider transfer server 60 is connected to a plurality of user nodes 18, and to a plurality of Internet service providers (ISP) 14 and public networks 16. Server 60 is connected to the user nodes 18 by a dial-up connection. Likewise, server 60 is connected via another dial-up connection to ISP's 14. Users can contract with an operator of a server 60 so that a user node 18 can connect to an access point of the server 60 at any time. When a user node 18 is connected to a server 60, the server 60 can select an ISP most suitable from among a plurality of ISP's to establish connection to a selected ISP 14 (also referred to as a selected ISP 14 hereinbelow). Thereafter, a communication channel between the user node 18 and the selected ISP 14 is generated through the server 60 so that the server 60, serving as a relay station, connects both parties. At this point, the access point of the user node 18 is directly connected to the selected ISP 14.

[0032] The ISP 14 may independently contract directly with other users besides the users via server 60. However, since the user who is under contract with the server 60 (also referred to as a secondary user hereafter) is connected to the ISP 14 by way of the server 60, the ISP 14 does not recognize those secondary uses individually but recognizes the server 60 as a single primary user. Thus, the ISP 14 charges the primary user (i.e., the operator of server 60) the connection fees relating to all secondary users.

[0033] Server 60 stores session records for each ISP 14 and user node 18, and collects the connection fees from the users which the server 60 pays to the ISP on behalf of the users. Similarly, based on the session records, the operator of server 60 charges the user a handling fee for the service for connecting the user to the ISP 14. The above scheme is equivalent to the users paying a connection fee to the ISP 14 in the usual manner, while the operator of server 60 derives revenue from the handling fee.

[0034] Fig. 3 is a block diagram showing the structure of server 60. In terms of hardware components, the server 60 is usually comprised of and realized by a CPU, a memory and a provider transfer managing program loaded in memory. It is understood by those skilled in the art that the way to realize such structure and system may vary greatly. It is to be noted that Fig. 3 does not show a hardware-oriented structure but simply a function-oriented block diagram.

[0035] First communication unit 100 communicates with a user node 18 via the external public network 16. Communication unit 100 is mainly comprised of a modem, a terminal adapter and a communication control program. Second communication unit 102, having a similar structure as first unit 100, communicates with the ISP 14 via the public network 16.

[0036] A user authenticating unit 118 identifies a user who is dial-up connected to first communication unit 100, based on data of user database 136. Assuming there is a contract between the operator of server 60 and the user, necessary information such as a user ID, a password, billing information and so forth are recorded in user database 136. If a user is not authenticated or properly identified, a disconnect instruction 150 is sent to first communication unit 100.

[0037] A selection circuit 104 connects the first communication unit 100 along path A to Web server functional block 120. Although to a user on the Web the server 60 seems to function as a normal server, it in fact functions as a Web server on public network 16.

[0038] When the second communication unit 102 establishes a connection to the selected ISP 14, selection circuit 104 selects a path B based on a selection signal 140 issued from unit 102. Then, the communication destination of the first communication unit 100 is switched from the Web server functional block 120 to the second communication unit 102 so that a connection is formed

between the first communication unit 100 and the second communication unit 102. Thereafter, the user gets connection to the Internet through the selected ISP 14. When the user disconnects at first communication unit 100, a disconnection signal 144 is sent to the second communication unit 102 so that the connection between the second communication unit 102 and the ISP 14 is also disconnected.

[0039] When the communication between units 100 and 102 is a digital signal, the selection circuit 104 can utilize a transceiver gate having an output disable terminal. When the signal is analog, as with most public phone lines, the selection circuit 104 may comprise a transfer gate or a transfer telephone device as disclosed in Japanese Patent Application Laid Open No. Sho60-198950, which shows a transformer between the first communication unit and the second communication unit so as to form an inductive connection.

[0040] When the second communication unit 102 makes a dial-up connection to the selected ISP 14, an authentication data storing unit 116 sends data such as user ID and password, in response to an authentication request from the ISP 14. Thereby, server 60 is recognized as a user by the selected ISP 14.

[0041] A service state detecting unit 108 detects the state of the connection server of each ISP 14, especially how congested the line is and the connection fee, and that information is registered in a provider information database 110. Since the degree of line congestion changes constantly, it is preferably detected

as often as possible. Dummy data may be downloaded by connecting to each ISP 14 at regularly recurring intervals of time so as to measure a data transfer rate. Moreover, in the case where the ISP 14 itself publicly announces the line congestion status, such is itself stored. When the ISP 14 has a plurality of access points, it is preferred that the line congestion status be detected for all such access points.

[0042] Though the connection fee is usually fixed, it is sometimes revised so the content of the provider information database 110 should be updated at appropriate times via service state detecting unit 108. Since there are some ISP's which change the connection fee depending on time periods, the service state detecting unit updates the connection fee based on the current time.

[0043] The provider information database 110 stores data on the various ISP's. Fig. 4 is a table showing an example of data structure of the provider information database 110. The provider information database 110 includes a provider column 200, an access point column 202, a connection fee column 204, a priority column 206, a line state column 208 and a handling fee schedule column 210. For example, the provider ABC has two access points where the connection fee during 12:00 – 17:00 is free due to a daytime discount or the like and is 15 yen per minute during the rest of time period.

[0044] In the priority column 206, indicator "0" is usually there while with indicator "1" showing, the provider has a right of being connected on a priority

basis even if all the ISP's present the same condition. The priority column 206 is established by an ISP. The handling fee for such ISP is likely higher, as described later.

[0045] The line state column 208 indicates the degree of line congestion for each ISP, and is updated at appropriate intervals by service state detecting unit 108. This indicates to percentage of lines at each access point which are busy or in use. For example, 40% of provider ABC are in use. As this number approaches 100, line connection becomes more difficult. For example, provider STU and a provider XYZ each provider owns an access point which is 3% is busy. In terms of the line congestion, both providers present the same condition.

[0046] The handling fee schedule column 210 lists the handling fees (servicing fee) for each ISP to which the operator of the server 60 connects the user. Here, 40% intermediary connection fee is set for provider XYZ which is the priority connection, while 20% is set for other ISP's. The "intermediary connection fee" is the fee which the secondary user is to pay for the connection and, is the revenue which the ISP receives. Thus, this intermediary fee comes into effect only when the server 60 is involved, and its rate may be set relatively high. Conversely, where the server bears the telephone charges for the user to get connected, the service value for an increased number of users who utilize the same server increases, thereby an ISP will tend to seek a particular operator.

[0047] Referring back to Fig. 3, the Web server functional block 120 includes a group of functional modules which behaves like a Web server when the secondary user accesses the server 60. A state provision unit 122 reads the state of each ISP from the provider information database 110 and sends it to the user in the form of an HTML document. The user can confirm this on a browser. A preference registration unit 124 engages in the selection of an ISP and provides an interface which stores the preferences of users in user preference database 112. When a user manually instructs the selection of an ISP, selection instruction acquiring unit 126 acquires the data and sends it to provider selection unit 106. Preference registration unit 124 and selection instruction acquiring unit 126 can be Common Gateway Interface (CGI) programs or the like resident in the Web server functional block 120.

[0048] Fig. 5 shows a screen 22 on a user terminal displaying the preference registration unit 124. Here displayed are a service summary 222 of server 60 and a selection item region 224 in which the user prioritizes the manner of selecting an ISP. As candidates, there is "connection fee", "line congestion degree", and a column marked "others" in which the user can fill another parameter. By checking any of these items and then sending it by clicking the SEND button, the user's request will be reflected by the selection of an ISP. Moreover, an item in which "a provider state is confirmed before connection" is provided as an option so that the user who does not wish the server to automatically select an ISP may manually select an ISP of his/her choice.

[0049] Fig. 6 is a table showing data inside the user preference database 112. Here, a user ID is entered in a user column 250 and a user's intention or request is entered in a request column 252. For example, the user "TARO" is a type where the connection fee is most important, and wishes the server to automatically select an ISP on that basis. The user "HIRO" is a type to whom line congestion is important, and wishes to confirm the state of a provider every time. For some users, connection speed is affected by the degree of congestion on the line, which in turn affects the cost of the on-line time.

[0050] Referring back to Fig. 3, the provider selection unit 106 selects the most suitable ISP according to the provider information database 110, the user preference database 112 and a manual selection instruction 142 from the user. The result of the selection is sent to the second communication unit 102 so as to execute a dial-up connection.

[0051] A session managing unit 130 supervises the connection state of the second communication unit 102 and the ISP 14, and its log-in is recorded in a session table 132. Fig. 7 is a table showing the data in the session table 132. Table 132 includes a session number column 300, a user column 250, a provider column 200, a connection time column 306 and a connection fee column 308. The session number column 300 is a serial number which specifies a session. The session number column 300 and the user column 250 indicate the user node 18 and the ISP 14 which the server 60 relayed for each

session. The connection time column 306 shows the duration of the session, and connection fee column 308 shows an amount of fees which the ISP charges for the session. The connection fees in column 308 are computed by consulting the connection time 306 and the connection fee column 204 of the provider information database 110. For example, the user of the session "1" is TARO and the provider thereof is ABC and the connection time thereof is 15 minutes 31 seconds, and the connection fee is 0 due to the daytime discount in the provider ABC.

[0052] A charge unit 134 calculates the amount to be billed to the ISP for the handling fee, and another charge to be billed to the user as the connection fee, based on the data in session table 132. Fig. 8 is a table showing the details of a debit note 320 sent to provider ABC. The total connection time shown in column 322 during which the server 60 connects the user to this provider is recorded as "58200 minutes". Similarly, the total number of connections established is recorded as "6215" in column 324, and the total connection fee is recorded as "163000 yen" in column 326. The total connection fee 326 is same as the "intermediary connection fee" in the handling fee schedule column 210 shown in Fig. 4. The handling fee 328 is 20% of the total connection fee according to the handling fee schedule column 210, and is thus recorded as "32600 yen". Eventually, this amount of 32600 yen is billed to the provider as the handling fee. Since the provider will charge "163000 yen" as the total connection fee, the difference therebetween may be remitted to the provider ABC.

[0053] Fig. 9 is a table showing the details of a debit note 340 for the connection fee charged to user TARO. Here are shown a provider, column 342, lists the sessions according to TARO's request, the total connection time 344 for each provider, and the total connection fee 346 for said each provider. Lastly, the total connection fee of "963 yen" is entered in the debit note 340.

[0054] Fig. 10 shows procedures for the series of processes performed between the ISP 14, the server 60 and the user node 18. Without a provider transfer service, the server generates the provider information database 110 and the user preference database 112 (S10). When the user node 18 contacts the server by a dial-up connection (S12), the server 60 authenticates this user (S14). If there is no problem, a connection is established between the user node 18 and the server 60 (S16).

[0055] The server 60 reads out the data of the ISP 14 from the provider information database 110 (S18) and the read-out data are displayed on a screen of the user node 18 via the state provision unit 122 (S20). Simultaneously, the server 60 selects an ISP for the user by referring to the user preference database 112 (S22), then the server 60 connects the user to the selected ISP by a dial-up connection. Fig. 11 is a screen, showing the current status of the ISP 14, displayed on the user terminal. Here, the status of provider ABC 262 and provider STU are displayed in terms of both the line usage rate and the connection fee. Also displayed is a connection display 266

which indicates that the server 60 (namely, the user) is being currently connected to the selected provider ABC. If the user wishes to change to another ISP, a new dial-up connection is attempted by clicking on "destination-manually-specified" button 268. When the connection is not made automatically when the user selects "confirm" in the request column 252 of the user preference database 112, the connection display 266 is not displayed and the destination-manually-specified button 268 is ready to be clicked.

[0056] When an ISP authenticates the server 60 which attempted to establish a connection by the dial-up, as a legitimate user (S26), connection is established between the ISP and the server (S28). Then, the selection circuit 104 switches from the path A to the path B (S30), and the connection is actually established between the ISP 14 and the user node 18 (S32).

[0057] Thereafter, the user does whatever he wishes during the Internet connection realized through the ISP 14. When the connection is no longer wanted, the user disconnects the line between the first communication 100 and the user (S34). The, the line between the second communication unit 102 and the ISP 14 is also disconnected (S36) so that a session is completed and its record is added to the session table 132 (S38). Finally, billing data on the user and the ISP 14 are generated based on the session table 132 (S40) and thus, the series of processes are completed.

[0058] The present invention has been described based on the embodiments which are only exemplary. It is understood by those skilled in the art that there exist other various modifications to the combination of each component and each processing described and that such modifications are encompassed by the scope of the present invention. For example, combination of the internal structure of the server 60 shown in Fig. 3 may be modified to a large degree; the user preference data base 112 and the user authenticating unit 118 may be configured in an integrated manner; data of line usage rate and so on which vary on a real-time basis may be managed in a manner such that said data are separated from the provider information database 110. Moreover, the server 60 may be provided with full-scale line switching capability.

[0059] Moreover, there may be provided a plurality of the second communication units 102 such that they can be constantly or permanently connected to each of a plurality of the ISP's. In that case, the selection circuit 104 will select the second communication unit 102 connected constantly to the selected provider.

[0060] As for Fig. 10, various modifications are possible. For example, prior to or after establishment of the connection between the user node 18 and the server 60, the service state detecting unit 108 may access each provider in order to obtain the latest data on the providers.

[0061] Accordingly, the present embodiments achieve a network connection service with high usability and practicality and increased convenience for the users. Moreover, a service is provided which is profitable to providers that provide the network connection servicing.

[0062] Although the present invention has been described by way of exemplary embodiments, it should be understood that many changes and substitutions may be made by those skilled in the art without departing from the spirit and the scope of the present invention which is defined by the appended claims.